

CLAIMS

1. a composition of matter comprising:
  - a metal oxide substrate which can be formed into a sol;
  - 5 a water soluble, acid moiety having a hydrocarbyl group with olefinic unsaturation bound to said metal oxide substrate; and
  - a water soluble, free radical initiator.
2. The composition of Claim 1 wherein said metal oxide comprises an alumina.  
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3. The composition of Claim 2 wherein said alumina is selected from the group consisting of boemite alumina, gamma alumina, delta alumina, theta alumina, alpha alumina, silica-alumina mixed oxides, titania-alumina mixed oxides and mixtures thereof.  
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4. The composition of Claim 3 wherein said alumina comprises boemite alumina.  
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5. The composition of Claim 1 wherein said acid moiety is selected from the group consisting of (a) aliphatic carboxylic acids, (b) aromatic carboxylic acids, (c) sulfonic acid derivatives of unsaturated carboxylic acids, (d) sulfinic acid derivatives of unsaturated carboxylic acids, (e) phosphonic acid derivatives of unsaturated carboxylic acids, (g) sulfate

derivatives of unsaturated carboxyl acids, phosphate derivatives of unsaturated carboxylic acids, (h) salts of (a)-(g) and mixtures thereof.

6. The composition of Claim 1 wherein said free radical initiator is selected from  
5 the group consisting of persulfates, organic peroxides, inorganic peroxide, azonitrile compounds and mixtures thereof.

7. A functionalized polymeric composition comprising:  
the reaction product of any of the compositions of Claims 1-6 and a polymer that is  
10 substantially free of functional groups.

8. A process for making a modified metal oxide comprising:  
forming an aqueous sol of said metal oxide;  
mixing said aqueous sol of said metal oxide with a water soluble, acid moiety having  
15 a hydrocarbyl group with olefinic unsaturation; and  
mixing said aqueous sol and said and moiety with a free radical initiator to form an aqueous medium precursor; and  
removing liquid from said aqueous precursor and recovering a dry, modified metal oxide.

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9. A process for producing a functionalized polymer comprising:

mixing a composition of matter according to any of Claims 1-6 with a polymer that is substantially free of functional groups under conditions to decompose said free radical initiator.